NCATS Improving Health Through Smarter Science

# Biomedical Data Translator

*Revealing new connections among existing data*

- *New research opportunities*
- *New intervention opportunities*
- *New "patient populations"*
- *More success in clinical trials*

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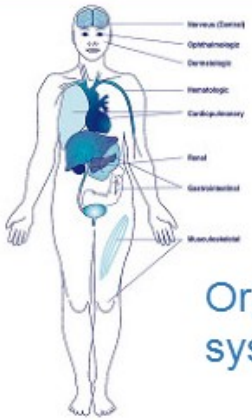
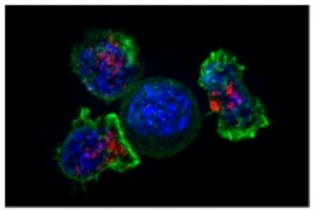
# Data Types



Organ systems

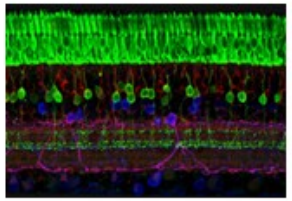
KEGG PATHWAY Database

Wiring diagrams of molecular interactions, reactions, and relations



Cells


Tissues

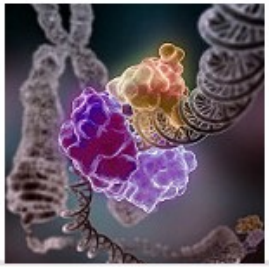


Health records

RCSB PDB PROTEIN DATA BANK

An Information Portal to 119137 Biological Macromolecular Structures

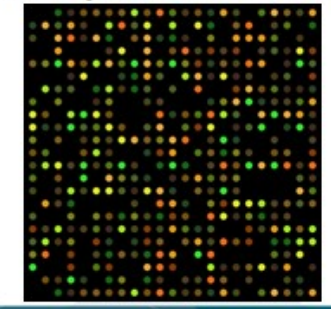
Gene mutations / modifiers



NCBI Resources How To

GEO Home | Documentation | Query & Browse

Gene Expression Omnibus



Clinical trial data



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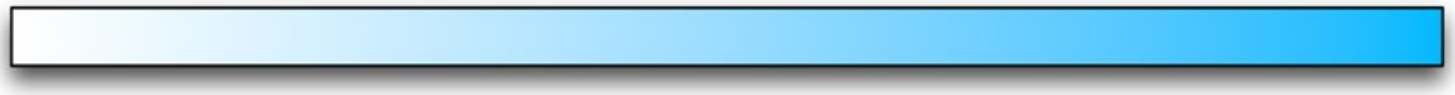
# Where are we going?

What?
Which?
Where?

Why?
How?
What if?



Where is this gene expressed?

How should clinical and/or biological subtypes of disease X be identified for the purposes of patient stratification and designing clinical trials?

# Initial Goals for the Program

- This is about assessing feasibility and design
  - what will be technically and scientifically possible?
  - what will it cost?
- Identify high-value data sources
- Develop a plan for integrating across a variety of data types
- Develop queries
- Run demonstration projects
- Define the requirements for a comprehensive Translator

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# NCATS Be Nimble, NCATS Be Quick: *Other Transactions* Are Different

- Solicitation
  - **On our website**, not in the NIH Guide for Grants and Contracts
- Eligibility
  - **Includes Individuals**, not just institutions/organizations
- Application content and submission includes
  - **Submit via e-mail**, not Grants.gov
- Evaluation
  - Objective review to assess science and complementarity
  - Included in-person presentations by invitees
- Implementation
  - Highly collaborative, staff-intensive
  - **Dynamic management**
    - Projects or components of projects can be expanded, modified, partnered or discontinued depending on the needs of the science

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# Participating Institutions









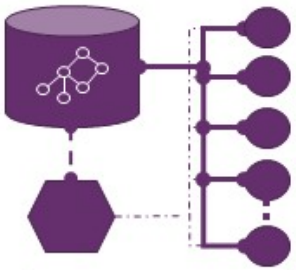




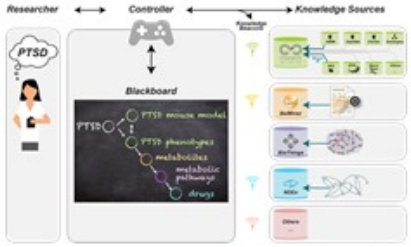


The Broad Institute of MIT and Harvard

First Face-to-Face



Blackboard/ Architecture




Adapt Knowledge Sources to Interact with Blackboard

renci
THE UNIVERSITY of NORTH CAROLINA at CHAPEL HILL

Public Meeting

Sept '16 | Oct '16 | Nov '16 | Jan '17 | May '17 | Sept '17 | Oct ' 17

5 Awards Issued

Funds Released

$

Reasoning Tool FOA

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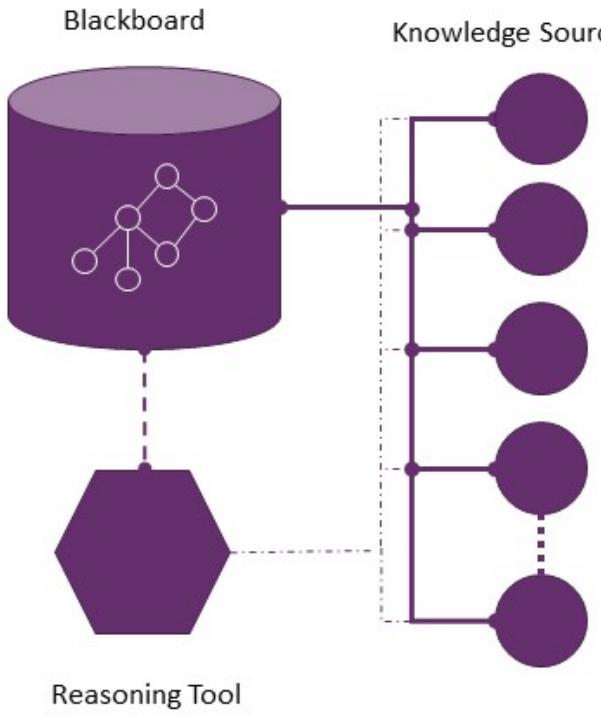
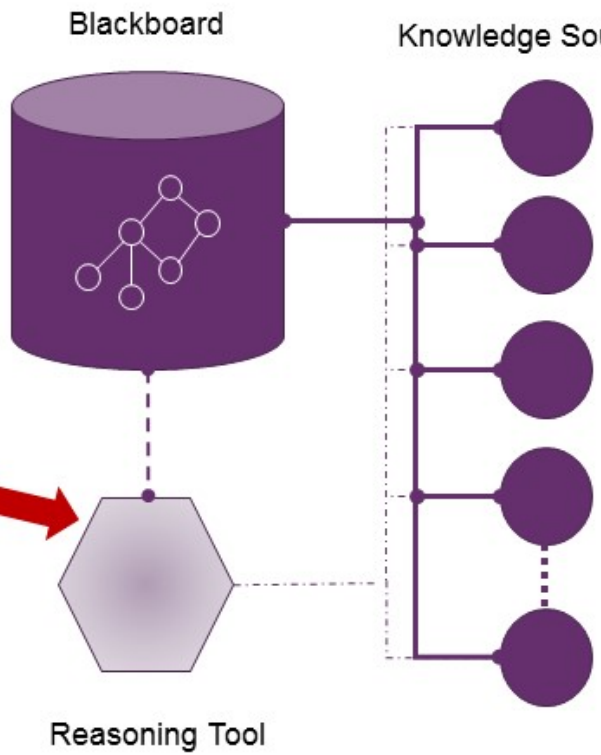
# January 2017 Meeting




*Imagine a group of human specialists seated next to a large blackboard. The specialists are working cooperatively to solve a problem, using the blackboard as the workplace for developing the solution.*

AI Expert 6(9), 40—47, Sep 1991

# Blackboard Architecture




We still need this

Blackboard system is suitable for:

- Open-ended problems with no obvious line of attack
- Problems that require dynamic decision making
- Problems that span many domains and levels of abstraction
- Inherently lends itself to microsystems architecture

# Reasoning Tool Funding Opportunity Announcement

- https://ncats.nih.gov/translator/funding
  or NOT-TR-17-023

- Other Transaction Authority
  - Not a grant, contract, or cooperative agreement

- Eligibility includes individual US Citizens
  - Also open to US and Foreign organizations & institutions

- $3,000,000 set aside for 3 awards

- 10-month project period

# Unique 3-step application process

- Step 1 – complete series of computational tasks – "the challenge"
  - access FOA and instructions for concept letter submission
- Step 2 – email concept letter **by September 22**
  - successful teams receive written notification with instructions for full proposal and presentation
- Step 3 – proposal submission

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# About "The Challenge"

- Designed to ensure applicants have the requisite skills to develop a reasoning tool
  - Don't just tell us you have the skills…show us
- The tasks provide background and insight into building a biomedical reasoning tool prototype for this program
- Upon successful completion of each task, additional sections of the funding opportunity will be revealed
- After the submission period for the concept letter has closed, the entire FOA will be made available on the NCATS website


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# You are invited!

- **When:**
  - October 25, 2017
- **Where:** renci
  - The Renaissance Computing Institute (RENCI), an institute of UNC at Chapel Hill
- **Who:**
  - Translational researchers and scientists developing new programs in data science
- **What:**
  - Learn about progress of the program
  - Brainstorm with us
- **Register:**
  - Eventbrite.com search NCATS/Data Translator

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